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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/679,696

10/07/2003

Junichi Sato

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3574

23117

7590

06/16/2005

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EXAMINER

MERCEDES, DISMERY E

ART UNIT

PAPER NUMBER

2651

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/679,696

Applicant(s)

SATO ET AL.

Examiner

Dismery E. Mercedes

Art Unit

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03/03/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Response to Arguments***

1. Applicant's Amendment filed on March 3, 2005 has been fully considered and entered.
2. Applicant's arguments with respect to claims 1 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1-5, 13-17, 25-26, 29-30, 33-34, 37-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (US 6,804,822 B2).

As to Claim 1, Sato et al. discloses a magnetic recording medium, comprising: a substrate (as depicted in Fig.1, "2"); and a magnetic layer, made of amorphous magnetic material, for magnetically recording information (as depicted in Fig.1, "4" and col.8, lines 5-6), wherein the magnetic layer has bumps on a surface thereof, and density of the bumps is 2 not less than 400 bumps/ $\mu\text{m}^2$  (as depicted in Fig.18; Col.23, lines 37-50).

As to Claim 2, Sato et al. further discloses wherein the bumps are formed by providing an underlayer, made of nonmagnetic metal element between the substrate and the magnetic layer (as depicted in Fig.1, col.8, lines 4-5).

As to Claim 3, Sato et al. further discloses wherein the nonmagnetic metal element is aluminum (col.9, lines 10-19).

As to Claim 4, Sato et al. further discloses wherein a magnetic compensation temperature thereof is not less than 25 degrees Celsius (col.33, lines 34-35).

As to Claim 5, Sato et al. further discloses magnetic layer is to magnetically record the information by receiving heat and a magnetic field that are applied (col.34, lines 24-30).

As to Claim 13, Sato et al. discloses a magnetic recording medium, comprising: a substrate (as depicted in Fig.1, "2"); and a magnetic layer, made of amorphous magnetic material, for magnetically recording information (as depicted in Fig.1, "4" and col.8, lines 5-6), wherein the magnetic layer has bumps a side of the magnetic, and density of the bumps is not less than 400 bumps/ $\mu\text{m}^2$  (as depicted in Fig.18; col.11, lines 30-37; col.13, lines 15-21; Col.23, lines 37-50).

As to Claims 14-17 have limitations similar to those treated in the above rejections of claims 2-5 and are met by the references as discussed above.

As to Claim 25 & 33, Sato et al. discloses a magnetic recording medium, comprising: a substrate (as depicted in Fig.1, "2"); and a magnetic layer, made of amorphous magnetic material, for magnetically recording information (as depicted in Fig.1, "4" and col.8, lines 5-6), wherein the magnetic layer has bumps on a surface thereof, and density of the bumps is 2 not less than 400 bumps/ $\mu\text{m}^2$  (as depicted in Fig.18; Col.23, lines 37-50), and a magnetic field application means for applying a magnetic field, which determines a magnetization direction to the magnetic layer, of the magnetic layer (as depicted in Fig.2, "12" and col.13, lines 10-28).

As to Claim 26 & 34, Sato et al. further discloses heating means for locally heating the magnetic layer wherein the magnetic field application means applies the magnetic field, which determines the magnetization direction of the magnetic layer, to at least one part of a heated region in the magnetic layer, so that the magnetic layer magnetically records the information by receiving heat and a magnetic field that are applied (as depicted in Fig.2, "14" and col.13, lines 49-60).

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As to Claim 29 & 37, Sato et al. discloses a magnetic recording medium, comprising: a substrate (as depicted in Fig.1, "2"); and a magnetic layer, made of amorphous magnetic material, for magnetically recording information (as depicted in Fig.1, "4" and col.8, lines 5-6), wherein the magnetic layer has bumps a side of the magnetic, and density of the bumps is not less than 400 bumps/ $\mu\text{m}^2$  (as depicted in Fig.18; col.11, lines 30-37; col.13, lines 15-21; Col.23, lines 37-50), and magnetic field application means for applying a magnetic field, which determines a magnetization direction to the magnetic layer, of the magnetic layer (as depicted in Fig.2, "12" and col.13, lines 10-28).

As to Claim 30 & 38, has limitations similar to those treated in the rejection of Claim 26, and are met by the references discussed above.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 6,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al., in view of Song et al. (US 6,472,049).

Sato et al. discloses the magnetic recording medium of claim 2, but fail to particularly disclose a compound made of (i) an element constituting the amorphous magnetic material and (ii) the nonmagnetic metal element is formed between the magnetic layer and the underlayer.

However, Song et al. discloses a compound constituting an element of amorphous magnetic material and nonmagnetic metal (col.4, line 10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention, to use a compound as taught by Song et al., the motivation being because such compound would provide the magnetic recording medium of Sato et al. with the enhanced capability of increasing the coercivity of the magnetic recording medium to obtain higher density (col.4, lines 1-11 of Song et al.).

As to Claim 18, has limitations similar to those treated in the above rejection of claim 6, and are met by the references as discussed supra.

7. Claims 7-12, 27-28,31-32,35-36 are rejected as being unpatentable over Sato et al. in view of Tsukuda et al. (US 2002/0060979 A1).

As to Claim 7, Sato et al. discloses a substrate; and a magnetic layer, made of amorphous magnetic material, for magnetically recording information, and subsequent layers provided on the magnetic layer (as depicted in Fig.1, "6 & 5"); wherein the magnetic layer has bumps on a surface thereof, and height of the bumps on a surface of the magnetic layer is not less than 2% with respect to an average layer thickness of the magnetic layer (as shown in Fig.7).

Sato et al. fails to particularly disclose bumps propagated through to the surfaces of the subsequent layers are provided with a shape different to that of the bumps on the surface of the magnetic layer.

However, Tsukuda et al. discloses stacked recording layers, and the bumps/protrusions/grooves are different in shape (abstract, and Fig.1 & 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the

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recording medium disclosed by Sato et al., by using different shape bumps/grooves as disclosed by Tsukuda et al. in the amorphous magnetic layer to provide guide grooves that may be used for servo tracking.

As to Claims 8-11 and 12 have limitations similar to those treated in claims 2-5 and 6 and are met by the references as discussed above.

As to Claim 19, has limitations similar to those treated in claim 7, and are met by the references as discussed above. Claim 19, however recites "the magnetic recording medium has bumps on a side of the magnetic layer" which is also discussed in the rejection of claim 13, supra.

As to Claims 20-23 and 24 have limitations similar to those treated in the rejection of claims 2-5 and 6 and are therefore met by the references as discussed above.

As to Claim 27 Sato et al. discloses a substrate; and a magnetic layer, made of amorphous magnetic material, for magnetically recording information, and subsequent layers provided on the magnetic layer; wherein the magnetic layer has bumps on a surface thereof, and height of the bumps on a surface of the magnetic layer is not less than 2% with respect to an average layer thickness of the magnetic layer (as shown in Fig.7), and magnetic field application means for applying a magnetic field, which determines a magnetization direction to the magnetic layer, of the magnetic layer (as depicted in Fig.2, "12" and col.13, lines 10-28).

Sato et al. fails to particularly disclose bumps propagated through to the surfaces of the subsequent layers are provided with a shape different to that of the bumps on the surface of the magnetic layer.

However, Tsukuda et al. discloses stacked recording layers, and the bumps/protrusions/grooves are different in shape (abstract, and Fig.1 & 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the

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recording medium disclosed by Sato et al., by using different shape bumps/grooves as disclosed by Tsukuda et al. in the amorphous magnetic layer to provide guide grooves that may be used for servo tracking.

As to Claim 28, has limitations similar to those treated in the rejection of claim 26 and are met by the references discussed in claim 26, above.

As to Claim 31,35 & 39, Sato et al. discloses a substrate; and a magnetic layer, made of amorphous magnetic material, for magnetically recording information, and subsequent layers provided on the magnetic layer (as depicted in Fig.1, "6" & "5"); wherein the magnetic layer has bumps on a surface thereof, and height of the bumps on a surface of the magnetic layer is not less than 2% with respect to an average layer thickness of the magnetic layer (as shown in Fig.7), and magnetic field application means for applying a magnetic field, which determines a magnetization direction to the magnetic layer, of the magnetic layer (as depicted in Fig.2, "12" and col.13, lines 10-28).

Sato et al. fails to particularly disclose bumps propagated through to the surfaces of the subsequent layers are provided with a shape different to that of the bumps on the surface of the magnetic layer.

However, Tsukuda et al. discloses stacked recording layers, and the bumps/protrusions/grooves are different in shape (abstract, and Fig.1 & 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the recording medium disclosed by Sato et al., by using different shape bumps/grooves as disclosed by Tsukuda et al. in the amorphous magnetic layer to provide guide grooves that may be used for servo tracking.



As to Claim 32,36 & 40 has similar limitations to those treated in the rejection of Claim 26, and are met by the references discussed above, respectively.

***Conclusion***


8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Nakama et al. (6,753,064 B1); Nakanouchi et al. (4,688,130); Kirino et al. (2003/0157373 A1) ; Wakamatsu et al. (5,917,168) ; Nishikawa et al. (2002/0081461) ; Terakado et al. (6,096,445).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E. Mercedes whose telephone number is 571-272-7558. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dismery E Mercedes  
Examiner  
Art Unit 2651

  
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